

CLAIMS

I claim:

1. A coating composition comprising:
 - (A) a hydroxyl functional component that is a reaction product of
 - (1) a polyisocyanate having two or more isocyanate groups, and
 - (2) a reactive compound having two or more hydroxyl groups and one amino group; and
 - (B) a component comprising a plurality of groups that are reactive with the hydroxyl groups on the hydroxyl functional component.
2. A composition according to Claim 1, wherein the reactive compound has three hydroxyl groups.
3. A composition according to Claim 1, wherein the polyisocyanate has three isocyanate groups.
4. A composition according to Claim 1, wherein the polyisocyanate comprises an isocyanurate of a diisocyanate.

- $$\left[\text{A}-\underset{\text{H}}{\text{N}}-\overset{\text{O}}{\parallel}{\text{C}}-\overset{\text{R1}}{\text{N}}-\text{L}-\left(\text{B}-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\overset{\text{R2}}{\text{NH}} \right)_{b'} \left(\text{B}-\text{OH} \right)_{b''} \right]_a$$

wherein

A is an organic radical;

L is a linking group of one or more atoms exclusive of hydrogen;

B is a linking group of one or more atoms exclusive of hydrogen, and may be same as or different from L;

a is greater than or equal to 2;

b' and b'' are greater than or equal to zero, and the sum of b' and b'' is 2 or greater; and

R1 and R2 are independently hydrogen or an alkyl, aryl, substituted alkyl, or substituted aryl group.

12. A resin according to claim 11, wherein b' is zero.
13. A resin according to claim 11, wherein b'' is zero.
14. A carbamate functional resin according to claim 11, wherein a is 3 and the sum of b' and b'' is 3.
15. A resin according to claim 11, wherein L and B are alkylene groups of four carbons or less.
16. A resin according to claim 11, wherein L and B are methylene.

17. A resin according to claim 16, wherein a is 3 and the sum of b' and b'' is 3.
18. A resin according to claim 11, wherein B includes ester linkages.
19. A resin according to claim 18 made by a process comprising the steps of:
 - reacting a polyisocyanate having two or more isocyanate groups with a reactive compound having one amino group and two or more hydroxyl groups to form a hydroxyl functional core;
 - chain extending the hydroxyl functional core by reacting it with a carboxylic anhydride or dicarboxylic acid to form a carboxylic functional core;
 - reacting the carboxyl functional core with an epoxy compound to produce a hydroxyl functional intermediate; and
 - carbamoylating the hydroxyl functional intermediate.
20. A resin according to claim 19, wherein the polyisocyanate comprises an isocyanurate of a diisocyanate.
21. A resin according to claim 11, made by a process comprising the steps of:
 - reacting a polyisocyanate having two or more isocyanate groups with a reactive compound having one amino group and two or more hydroxyl groups to form a hydroxyl functional core; and
 - carbamoylating the hydroxyl functional core.

22. A resin according to claim 21, wherein a is 3 and the sum of b' and b'' is 3.
23. A resin according to claim 21, wherein the polyisocyanate comprises an isocyanurate of an organic diisocyanate.
24. A coating composition comprising:
 - a carbamate functional resin according to claim 11; and
 - a component comprising a plurality of functional groups reactive with the carbamate groups on the carbamate functional resin.
25. A coating composition according to claim 24, further comprising a pigment.
26. A coating composition comprising:
 - a carbamate functional resin according to claim 21; and
 - a component comprising a plurality of functional groups reactive with the carbamate groups on the carbamate functional resin.
27. A coating composition according to claim 21, further comprising a pigment.
28. A method for making a carbamate functional resin, comprising the step of adding a carbamate group to a hydroxyl functional core,

wherein the core is a reaction product of a polyisocyanate having two or more isocyanate groups and a reactive compound having one amino group and two or more hydroxyl groups.

29. A method according to claim 28, wherein the polyisocyanate has three isocyanate groups and the reactive compound has three hydroxyl groups.

30. A method according to claim 28, wherein the polyisocyanate comprises an isocyanurate of an organic diisocyanate.

31. A method according to claim 28, wherein the step of adding a carbamate group comprises adding a carbamate group by transcarbamation.

32. A method according to claim 28, wherein the step of adding a carbamate group comprises reacting the hydroxyl functional core with a compound that contains an isocyanate group and a carbamate group.

33. A method according to claim 28, wherein the step of adding a carbamate group comprises the steps of:

- chain extending the hydroxyl functional core with a carboxylic anhydride or dicarboxylic acid to form a carboxy functional core;
- reacting the carboxy functional core with an epoxy compound to produce a hydroxyl functional intermediate; and

- carbamoylating the hydroxyl functional intermediate.

34. A method according to claim 33, wherein the carbamoylating step comprises adding a carbamate group by transcarbamation.

35. A method according to claim 33, wherein the carbamoylating step comprises reacting the hydroxyl functional intermediate with a compound that contains an isocyanate group and a carbamate group.